

## **5 Snow**

### **5.1 General Description**

Snow falls most commonly from November through May. It can fall at all elevations and range from light to heavy intensity. About five times a year, lower elevation stations may experience snowfalls exceeding 4-5 inches. Snowfalls of more than 10 inches from a single storm are rare other than at mountain locations. In 1972, a storm over five-days dropped 77.5 inches of snow at Summit. Blizzard conditions can occur in any winter, but are more common across eastern Montana. In any given winter, blizzards can occur two times. Ground blizzards can occur over the plains along the northern Rocky Mountain Front, due to normally high winds.

Total mean annual snowfall varies widely. At lower elevations in the east, snowfall can range from 25 to 40 inches. These amounts would also be seen over the drier southwest valleys. As one moves closer to the mountains, snowfall can range as high as 60-70 inches in central Montana. Over mountains locations, annual amounts are well over 200 inches. The weather pattern most favorable for precipitation is one with a low-pressure area just south of the state. This condition would provide relatively cool air at the surface, with warmer air overrunning the cooler surface air. Wind flow patterns generally bring moisture from the Pacific. During the summer months, a flow from the Gulf of Mexico will bring moisture to much of eastern Montana.

Though Montana lies a great distance from large moisture sources, its terrain allows moisture to be squeezed out of the atmosphere. Table 1 shows record snow events in Montana.

## 5.2 Snowfall records

Table 1. Record snow events in Montana.

	Snow Amount (inches)	Location			Ending Date	Number of Years of Non-Missing Data	Data Period Analyzed
		COOP Station Number	Station Name	State			
Greatest daily snowfall	48	245712	MILLEGAN 14 SE SHONKIN 7 S	MT	12/27/2003 05/29/1982	20	1903-2014
Greatest 2-day snowfall (snowed both days)	66	247540	SHONKIN 7 S	MT	05/29/1982	52	1903-2014
Greatest 3-day snowfall (snowed all 3 days)	73	246918	RED LODGE 2 N	MT	04/27/1984	105	1894-2014
Greatest 4-day snowfall (snowed all 4 days)	66	247978	SUMMIT	MT	01/22/1972	35	1903-2014
Greatest 5-day snowfall (snowed all 5 days)	75	247978	SUMMIT	MT	01/22/1972	35	1903-2014
Greatest 6-day snowfall (snowed all 6 days)	77.5	247978	SUMMIT	MT	01/22/1972	35	1903-2014
Greatest 7-day snowfall (snowed all 7 days)	76.5	243984	HAUGAN	MT	01/18/1913	62	1912-2014
Greatest monthly snowfall total	131.1	247978	SUMMIT	MT	01/1972	26	1903-2014
Greatest Aug-July snowfall total	426.0 368.9	247978	KINGS HILL SUMMIT	MT	1964-65 1943	5	1903-2014
Greatest daily Snow Depth	240 240 208  202 147	    247978	Grace (Boulldr M) Hebgen Bald Eagle Pk (Cabinets) Summit SUMMIT	    MT	Mar 1916 Mar 1919 03/28/1974  02/24/1979 02/18/1975	     16	1903-2014

Montana monthly record snowfall (inches)

Jan	131.1 E113	1972 2006	Summit Flattop Mtn
Feb	94.5	1976	Summit
Mar	86.4	1980	Heron
Apr	96.0	1958	Mystic Lake
May	74.0 64.0	1982 2011	Shonkin Flattop Mtn
Jun	31.0	2002	East Glacier
Jul	4.0	1972 1950	Summit Kings Hill
Aug	12.0	1992	St. Mary
Sep	37.5	1968	Del Bonita
Oct	61.0 58.0 49.0	1951 2009 2009	Summit Onion Park Millegan
Nov	81.0	1900	Augusta
Dec	125.0	1977	Cooke City

Most in 1 day, 1 month, one season

	<b>1 day</b>		<b>Month</b>		<b>Season</b>	
Billings	23.7	4 Apr 1955	42.3	Apr 1955	103.5	2013-14
Bozeman	11.0	23 Dec 1955	23.8	Jan 1949	97.8	1947-48
Butte	30.0	10 Oct 1911	32.5	Oct 1911	111.5	1916-17
Cut Bank	18.0	15 Dec 1987	30.0	Dec 1924	76.2	1946-47
Dillon	10.0	19 Apr 1987	24.2	Oct 1989	86.3	1988-89
Glasgow	14.1	2 Apr 1940	41.3	Jan 2011	108.7	2010-11
Great Falls	16.8	20 Apr 1973	35.4	Apr 2009	120.2	1988-89
Havre	26.9	28 Mar 1977	43.7	Apr 1967	93.4	1981-82
Helena	21.5	11 Nov 1959	46.4	Dec 1880	112.8	1880-81
Kalispell	20.2	27 Dec 1911	55.9	Feb 1936	146.3	1996-97
Lewistown	21.1	29 May 1982	42.5	Nov 1897	113.9	1981-82
Livingston	16.4	4 Dec 1998	40.5	Jan 1928	100.1	1979-80
Miles City	28.0	30 Mar 1894	35.3	Mar 1984	74.1	1911-12
Missoula	27.5	30 Nov 1893	54.1	Dec 1996	111.2	1996-97
West Yellowstone	24.0	20 Jan 1962	93.9	Dec 1994	316.6	1994-95

Table. Average snowiest months of record in Montana.

<b>Average Snowiest Months of record in Montana</b>		
<b>Month</b>	<b>Snowiest</b>	<b>Year</b>
January	24.9-in	1969
February	21.0-in	2014
March	18.5-in	1888
April	14.6-in	1967
May	7.1-in	1903
June	1.7-in	2001
July	0.1-in	1952
August	1.4-in	1992
September	4.4-in	1934
October	12.2-in	1919
November	18.1-in	1893
December	25.9-in	2008
Year	88.0-in	1955
Season	87.0-in	2010-11

### 5.3 Snow on ground averages

Snow on the ground varies widely throughout the winter season and each year. Generally, high mountain locations have ample snow cover, but it too can vary from year to year. The following tables show the highest 3 snow depths at locations from across the state. Following this table is another for end of month average snow depth at several locations across the state.

Baker	21-in	11/20/1977	15-in	01/2-3/1972	15-in	12/21-22/1963
Billings	33-in	4/5/1955	24-in	12/5-8/1978	22-in	12/09-10/1978
Bozeman MSU	29-in	02/21/1942	28-in	12/25-1996	26-in	01/25/1963
Butte	27-in	12/28-29/1996	24-in	12/26-27/1996	23-in	03/25/1952
Cut Bank	20-in	03/24/1914	18-in	12/30-31/1996	18-in	2/12-18/1978
Dillon	15-in	02/12-15/1949	14-in	01/27/1949	14-in	02/18-22/1942
Glasgow	29-in	02/11-12/2004	27-in	02/13-18/2004	26-in	02/19-2004
Glendive	27-in	02/15-17/1979	25-in	02/18-20/1978	24-in	02/08-09/2011
Great Falls	24-in	04/09/1975	22-in	04/10-1975	21-in	02/12-13/1978
Havre	31-in	05/02/1899	28-in	02/13-17/1978	27-in	03/30/1977

Helena	24-in	12/13/1917	23-in	01/27/1969	22-in	01/28/1969
Kalispell	61-in	12/30/1996	60-in	03/25/1948	58-in	12/31/1996
Lewistown	40-in	12/14/1937	40-in	03/06/1922	33-in	02/01-02/1978
Livingston	22-in	02/09/1975	20-in	02/08/1975	19-in	01/02/1928
Miles City	40-in	12/21-31/1948				
Missoula	27-in	12/29/1996	26-in	12/30/1996	25-in	12/28/1996
Sidney	25-in	02/15-16/1979	24-in	02/22-23/1979	23-in	02/01-03/2011
W Yellowstone	76-in	03/05-06/1956	75-in	03/01/1956	74-in	03/08/1956
State	79-in Hebgen Dam	03/25/1952	77-in Olney	01/09/1991	76-in W Yellowstone	03/05-06/1956

Location	Dec 1	Jan 1	Feb 1	Mar 1	Apr 1	May 1	Jun 1
Billings	1	2	1	1	0.4	T	0
Cut Bank	1	2	1	1	0.4	T	0
Dillon	1	2	3	3	1	0	0
Glasgow	1	4	4	3	0.1	0	0
Great Falls	1	2	1	1	0.3	1	0
Havre	1	4	2	2	0.5	0	0
Helena	1	1	1	1	0	0	0
Kalispell	3	9	6	4	T	0	0
Lewistown	2	4	3	2	2	1	1
Missoula	1	4	2	1	T	0	0
Albro Lake	20	31	41	50	60	56	30
Badger Pass	25	44	62	76	83	81	49
Beagle Spgs	13	22	27	31	36	28	7
Beaver Creek	17	33	45	54	58	53	21
Black Bear	40	65	90	102	109	97	64
Bloody Dick	12	23	32	37	38	24	2
Boulder Mtn	22	37	48	52	59	59	31
Brackett Ck	17	32	42	53	62	56	19
Carrot Basin	9	17	64	75	85	32	6
Clover Meadow	20	30	37	45	52	49	28
Copper Bottom	6	17	20	25	15	4	0
Copper Camp	32	65	82	94	98	85	33
Crystal Lake	30	48	39	43	46	81	49
Daisy Peak	20	31	27	31	36	47	13

Darkhorse Lake	13	21	66	70	76	33	11
Deadman	12	22	30	33	34	21	1
Divide	30	49	15	28	31	78	60
Dupuyer Ck	6	10	15	22	25	22	2
Elk Peak	12	27	42	51	62	68	45
Flattop	39	67	100	112	121	115	80
Frohner Meadow	7	15	20	23	23	15	1
Hoodoo Basin	31	66	91	102	115	100	56
Lakeview Ridge	13	20	19	35	35	30	4
Lemhi	12	22	30	35	38	34	8
Lick Ck	11	23	24	32	36	28	3
Lone Mtn	20	35	48	56	60	59	27
Lower Twin	17	33	40	51	58	59	41
Madison Plateau	8	24	57	66	71	18	1
Many Glacier	23	45	37	41	44	63	28
Moss Peak	34	58	76	87	102	103	70
Mount Lockhart	15	29	43	57	62	53	20
Mule Creek	16	29	39	45	51	50	30
Nevada Ridge	32	59	35	42	46	105	67
Noisy Basin	15	27	83	97	112	38	9
Onion Park	16	27	35	43	50	46	16
Pickfoot Ck	11	22	27	31	31	17	2
Pike Creek	17	31	49	54	62	49	13
Rocker Peak	15	26	34	39	46	45	26
Rocky Boy	5	9	14	13	12	5	2
Sacajawea	12	22	30	41	41	29	4
Short Creek	6	12	48	19	20	13	0
Shower Falls	27	41	50	60	69	72	54
Spur Park	23	34	47	55	62	60	36
Stringer Ck	13	23	31	37	40	30	3
Tepee Creek	14	28	37	28	49	39	6
Tizer Basin	13	20	24	45	35	28	2
Waldron	8	17	25	30	29	21	2
West Yellowstone	11	26	30	37	31	10	0
Whiskey Ck	15	34	45	53	55	38	7
Wood Lake	7	15	21	29	29	24	3
<b>Location</b>	<b>Dec 1</b>	<b>Jan 1</b>	<b>Feb 1</b>	<b>Mar 1</b>	<b>Apr 1</b>	<b>May 1</b>	<b>Jun 1</b>

